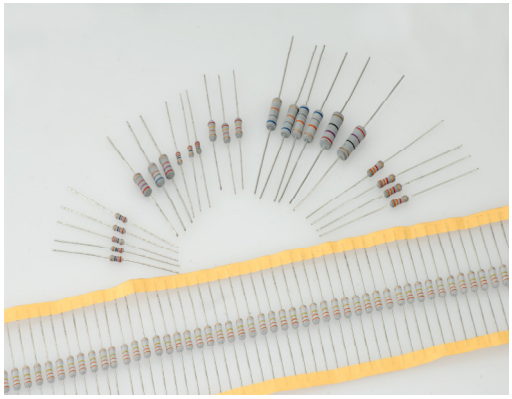
MFR — Electronic Components Pvt. Ltd.

METAL OXIDE RESISTORS

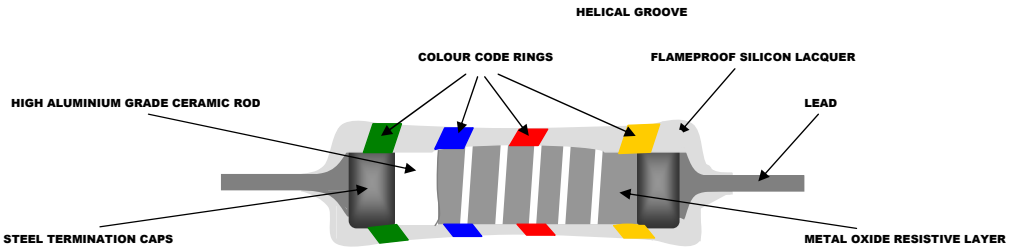
Series : MO & MOS

Features:

- Small in Size
- Electrical & Mechanical stability & high reliability.
- Best resistive to heat, humidity & non combustible.
- Low noise, with high resistance value which Wire Wound type can not be produced.
- **RoHS** Compliant directive 2002/95/EC.
- Available ranges from **10 Ohm ~1M Ohm.**
- TCR available **100, 200ppm/°C.**
- Miniature Size available for space savings.



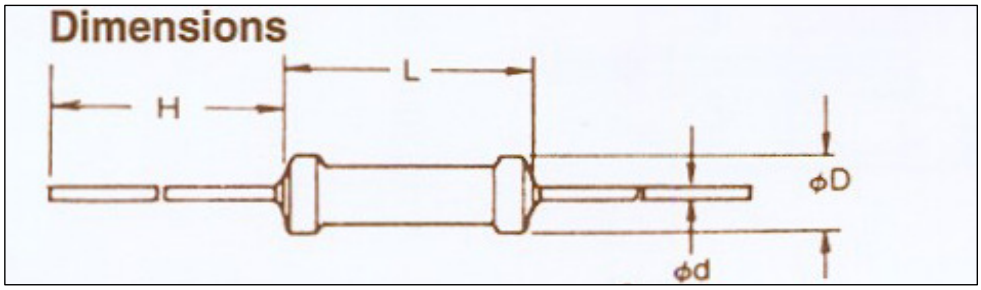
Construction :



Technical specification:

DESCRIPTION	GENERAL SERIES						MINIATURE SERIES				
	MO25	MO50	MO100	MO200	MO300	MO400	MOS50	MOS100	MOS200	MOS300	MOS400
Resistance range	±1% ;10Ω ~ 1MΩ										
Resistance tolerance	±1%, E24/E96 series; ±2% & ±5%, E24 series										
Temperature coefficient	100 ppm/℃ ~ 200 ppm/℃										
Maximum dissipation @ 70℃	0.25W	0.5W	1W	2W	3W	4W	0.5W	1W	2W	3W	4W
Maximum permissible voltage	250 V	350V	500V	500V	750V	750V	350V	500V	500V	750V	750V
Temperature range	-55° ~ +200°										
Stability, R max.											
Load	△ R±(5.0% +0.05Ω)										
Climatic test	△ R±(1.5% +0.05Ω)										
Soldering	△ R±(0.25% +0.05Ω)										
Short time overload	△ R±(0.25% +0.05Ω)										

Dimensions :



Physical Data:

1.0 GENERAL SERIES SPECIFICATION :

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	D	d ± 0.05	H	RESISTANCE RANGE	MAX. WORKING VOLTAGE	MAX. OVERLOAD VOLTAGE
MO25	0.25W	±1%, ±2% & ±5%	100 ~ 200	6.5± 0.5	2.3 ±0.2	0.6	25 min	10 Ω ~ 1MΩ	250V	500 V
MO50	0.5W	±1%, ±2% & ±5%	100 ~ 200	9.5± 1	3.5 ±0.5	0.6	25 min	10 Ω ~ 1MΩ	350V	700 V
MO100	1W	±1%, ±2% & ±5%	100 ~ 200	12± 1	4.5 ±0.5	0.8	24 min	10 Ω ~ 1MΩ	500V	1000 V
MO200	2W	±1%, ±2% & ±5%	100 ~ 200	16± 1	5.5 ±0.5	0.8	25 min	10 Ω ~ 1MΩ	500V	1000 V
MO300	3W	±1%, ±2% & ±5%	100 ~ 200	18 ±1	6.5 ±1	0.8	25 min	10 Ω ~ 1MΩ	500V	750V
MO400	4W	±1%, ±2% & ±5%	100 ~ 200	24± 1	8.5 ±1	0.8	25 min	10 Ω ~ 1MΩ	750V	1500 V

Note : Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

2.0 MINITURE SERIES SPECIFICATION:

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	D	d ± 0.05	H	RESISTANCE RANGE	MAX. WORKING VOLTAGE	MAX. OVERLOAD VOLTAGE
MOS50	0.5W	±1%, ±2% & ±5%	100 ~ 200	6.5± 0.5	2.3 ±0.2	0.6	25 min	10 Ω ~ 1MΩ	350V	700 V
MOS100	1W	±1%, ±2% & ±5%	100 ~ 200	9.5± 1	3.5 ±0.5	0.6	25 min	10 Ω ~ 1MΩ	500V	1000 V
MOS200	2W	±1%, ±2% & ±5%	100 ~ 200	12± 1	4.5 ±0.5	0.8	24 min	10 Ω ~ 1MΩ	500V	1000 V
MOS300	3W	±1%, ±2% & ±5%	100 ~ 200	16± 1	5.5 ±0.5	0.8	25 min	10 Ω ~ 1MΩ	500V	1000 V
MOS400	4W	±1%, ±2% & ±5%	100 ~ 200	18 ±1	6.5 ±1	0.8	25 min	10 Ω ~ 1MΩ	750V	1500V

Note : Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

Marking:

The MO & MOS series / type, the nominal resistance & tolerance are marked on the resistor body using four or five coloured bands in accordance with IEC publication 60062 "color codes for fixed resistors"

Material Specifications:

Element : Vacuum-deposited metal oxide alloy

Core : Fire cleaned high purity ceramic

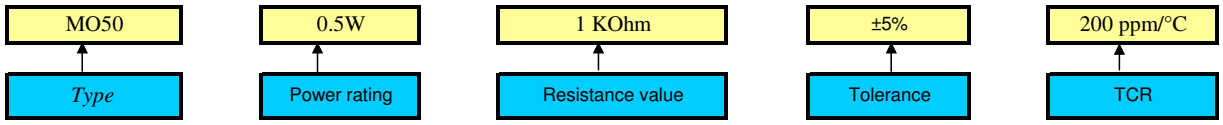
End caps : Steel caps

Coating : Flameproof silicon coat

Standard Terminals : Solderable - tinplated copper

Part Numbering Information:

Part Number : Type number, power rating, resistance value, tolerance, tcr.



Examples: PART NO. : MO50, 0.5W, 1 KOhm, ±5%, 200ppm/°C

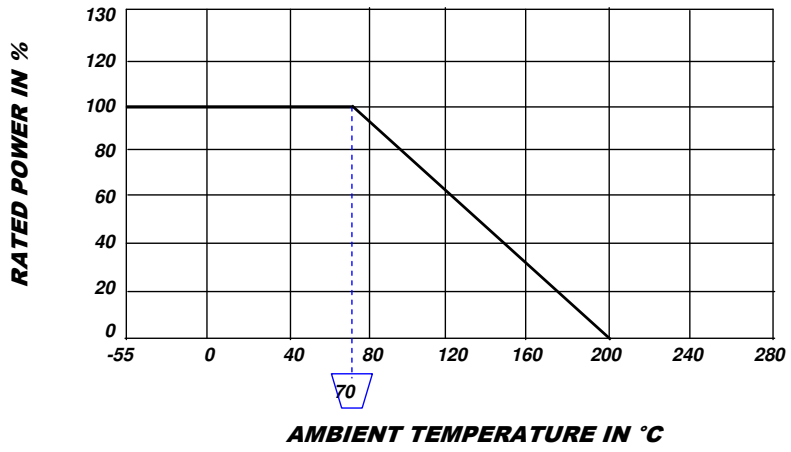
Packing Information:

TYPE	Pcs Per Poly Bag/ Blue box	Pcs Per Brown Box	Pcs Per Real
MO25 / MOS50	1,000	5,000	5000
MO50 / MOS100	500	2,500	2500
MO100 / MOS200	---	1,500	2500
MO200 / MOS300	---	1,000	2500
MO300/MOS400	---	300	---
MO400	---	250	----

Performance Data (Procedure & Requirements):

TEST	PROCEDURE	REQUIREMENTS
Robustness Of Termination		
1. Tensile Test	Load 10 N for 10 sec.	No visual damage
2. Bend Test	Load 5 N 90°, 180°, 90°	No visual damage
3. Torsion Test	3 X 360° in opposite directions	No visual damage △R/R max.: ±(0.25% +0.05 Ω)
Solderability Test	16 hrs steam or 16 hrs. at 155℃ 2 sec. ±0.5 sec. in solder at 235°±5℃ Using flux	>95% coverage covered (good tinning) & no damage
Resistance To Soldering Heat	at 350℃ for 3 sec., 2.5mm from the body	△R/R max.: ±(0.25% +0.05 Ω)
Temperature Cycling	30 minutes at -55℃ & 30 minutes at 150℃ Total 5 number of cycles.	No visual damage △R/R max.: ±(1.0% +0.05 Ω)
Dry Heat Test	16 hrs at 150℃	△R/R max.: ±(1.0% +0.05 Ω)
Cold Test	2 hrs at -55℃	△R/R max.: ±(0.25% +0.05 Ω)
Short Time Overload	2.5 X Rated voltage for 5 sec. @ 25℃	△R/R max.: ±(0.25 +0.05 Ω)
Endurance @ 70°C	2000 hrs. load with Pn (power nominal) 1.5 hr. ON & 0.5 hr. OFF	No visual damage △R/R max.: ±(5.0% +0.05 Ω)
Endurance @ Upper Category Temperature	1000 hrs. at 150℃ with no load	No visual damage △R/R max.: ±(5.0% +0.05 Ω)
Temperature Rise Test	Horizontally mounted, loaded with Pn	Hot spot temperature less than maximum body temperature
Damp Heat Steady State	56 days, 40℃; 90 to 95% Rh; dissipation ≤ 0.01Pn	No visual damage △R/R max.: ±(1.5% +0.05 Ω)
Temperature Coefficient	At 25/-55/25 ℃ & 25/150/25 ℃	Within specified limits
Insulation Resistance	V- Block method for 1 minute duration At 500 V dc	> 10^3 MΩ
Voltage proof test	V- Block method for 1 minute duration At 500 V	No flash over or break down should observed

Derating :


RATED POWER IN %
130
120
100
80
60
40
20
0
-55
0
40
80
120
160
200
240
280
70
AMBIENT TEMPERATURE IN °C